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Does Training Matter: A Systematic Review of Caregiver Training Within Human-Canine and Human-Human Dyads

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INTRODUCTION

- Around 32,000 years ago, canines (*Canis lupus familiaris*) were the first animals to be domesticated by early man (Clutton-Brock, 1995; Thalmann *et al.*, 2013). Hence, the two species share a common environment for a long period of time leading to interactions that affect several aspects of human social life and economics (Udell and Wynne, 2008).
- Human-canine interactions share many characteristics of parent-child relationships:
 - The attachment bonds dogs and owners form are similar to those formed by parents and infants (Prato-Previde *et al.*, 2003; Topal *et al.*, 1998).
 - “Dog-directed speech” (DDS) shares acoustic features of “infant-directed speech” (IDS), and dogs show a preference for DDS (Ben-Aderet *et al.*, 2017; Benjamin and Slocombe, 2018; Burnham *et al.*, 1998).
 - Owners and dogs experience an important oxytocin secretion after a short period of cuddling or after sharing a mutual gaze (Nagasawa *et al.*, 2015; Nagasawa *et al.*, 2009; Odendaal and Meintjes, 2003).
- However, dogs can also develop undesired behaviours, i.e. aggressive responses, stereotypic behaviours, and/or fear-related responses (e.g. Butler *et al.*, 2011; Echterling-Savage *et al.*, 2015; Hall *et al.*, 2015; Pfaller-Sadovsky *et al.*, 2017). In such circumstances, owners typically contact animal behaviourists to receive guidance on how to train their dogs.
- The role of companion-dog owners as interventionists has only recently started to become a focus of research (e.g. Echterling-Savage *et al.*, 2015). Although, many commonalities between the applied work of animal behaviourists and BCBAs® (Behavior Analyst Certification Board, 2018) were found in a recent survey by Gray and Diller (2017).
- The aim of the current review was to assess and compare existing literature involving caregiver training with human-canine and human-human dyads.

METHOD

- The search procedures followed the recommendations of Petticrew and Roberts (2006) for conducting systematic literature reviews and meta-analyses, and they complied with the PRISMA guidelines for selection of relevant records (i.e. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines – Liberati *et al.*, 2009; Moher *et al.*, 2009).
- Following databases and repositories were systematically searched (no restrictions, such as limitation of publication dates were put in place): Directory of European research theses (DART-Europe), Education Resources Information Center (ERIC), International Bibliography of the Social Sciences (IBSS), OpenGrey, PsychINFO, PubMed, ScienceDirect, Scopus, and Web of Science.
- Records were included if (i.e. inclusion criteria):
 - They constituted original research (i.e. peer-reviewed papers), conference proceedings, case studies or doctoral theses
 - Parents (i.e. “caregivers”) were given advice and/or have implemented the behavioural treatments/interventions;
 - Dog owners (i.e. “caregivers”) were given advice and/or have implemented the behavioural treatment/interventions;
 - Caregivers received advice and/or implemented the behavioural treatment/intervention in home, clinical or any other external settings (e.g. therapy rooms, practices, dog training facilities or shelter environment)
 - Caregivers were aged 18 years or older
 - The literature was concerned with giving advice and/or training caregivers on how to implement a behaviour change programme
 - Records involved either human or canine learners
 - Sources were published in English or German
- Figure 1 depicts the study selection process.
- Inter-rater agreement (IRA) was calculated by number of agreements divided by number of agreements plus number of disagreements multiplied by 100. IRA computation yielded a 94% agreement score across both reviewers.
- All eligible studies were coded on following criteria: (a) reference information (i.e. title, authors, date); (b) sample size; (c) demographic information and information whether human- or canine learners were participating; (d) description of undesired learner behaviour; (e) single case methods (SCMs), in-between subjects designs, case studies; (f) description of the intervention type; (g) procedural integrity of intervention implementation (if any); (h) qualitative outcomes of caregiver training were either positive, mixed, negative or not clearly stated, as indicated by the study authors.
- The Inter-coder agreement (ICA) score was determined by number of agreements divided by number of agreements plus number of disagreements multiplied by 100. This computation was done for each of the 38 variables and yielded an ICA of 85% across both coders.

RESULTS

- The majority of eligible canine-related papers comprised case studies (25%; n=19), while over a third of human-related papers implemented SCMs (35%; n=26). See Figure 2
- Seventeen percent (n=13) of the case studies did not clearly state their outcomes, of which 9% (n=7) used oral instruction/advice only. Generally, latter was also the most widely used type of instruction for dog owners across case studies (11%; n=9). See Table 1.
- Over a quarter of SCMs yielded positive outcomes (28%; n=21) utilising packages for parent training. With 19% (n=14), packages were the most implemented type of teaching approach used. See Table 1.
- Overall, more than half of the caregiver training interventions resulted in positive outcomes (55%; n=42), while 9% (n=7) showed mixed outcomes, none reported negative outcomes, and 34% (n=26) did not clearly state the outcomes. See Figure 2.

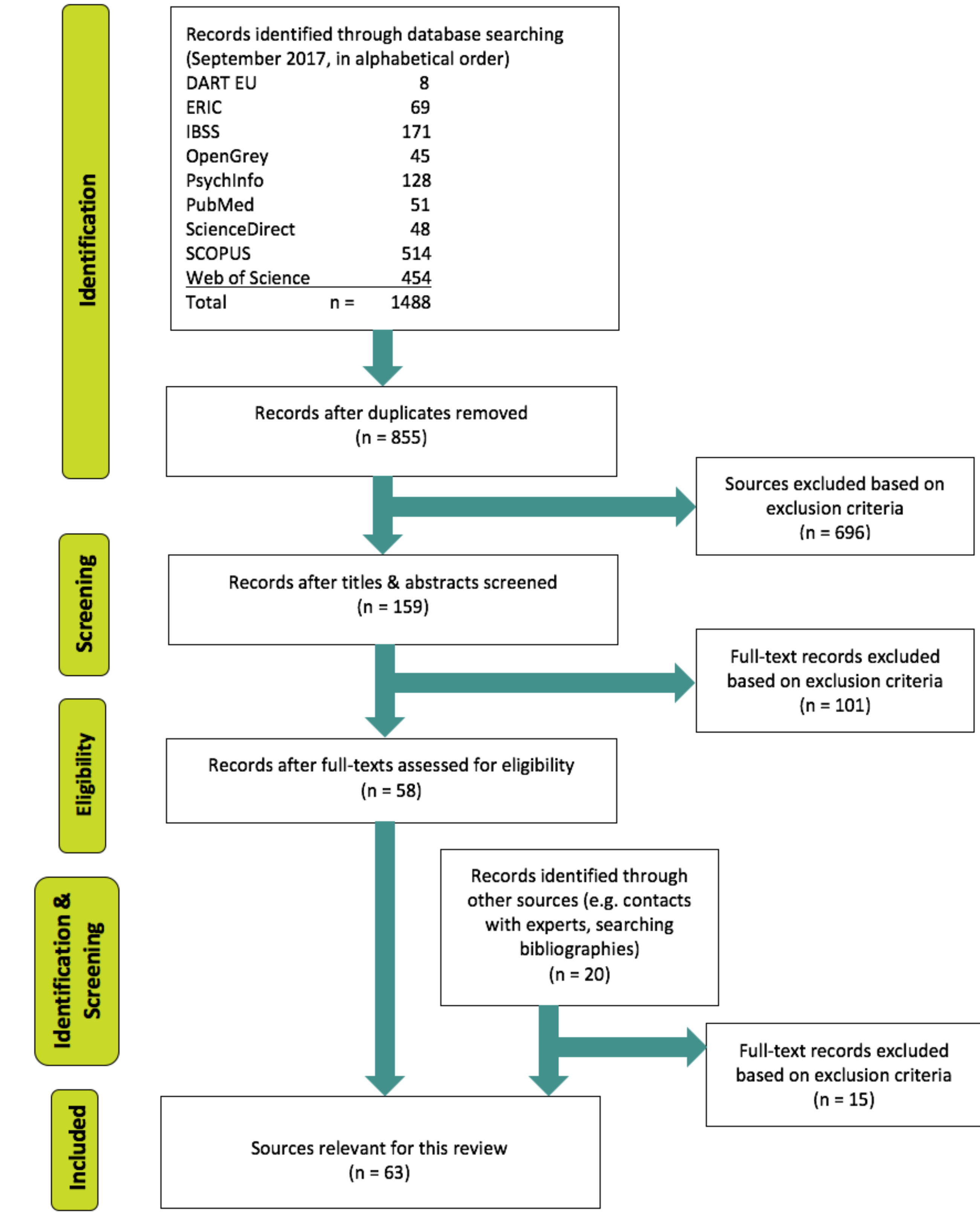


Figure 1. Flow diagramme of the selection process stages for identification of studies eligible for further analysis (adapted after PRISMA guidelines – Liberati *et al.*, 2009; Moher *et al.*, 2009)

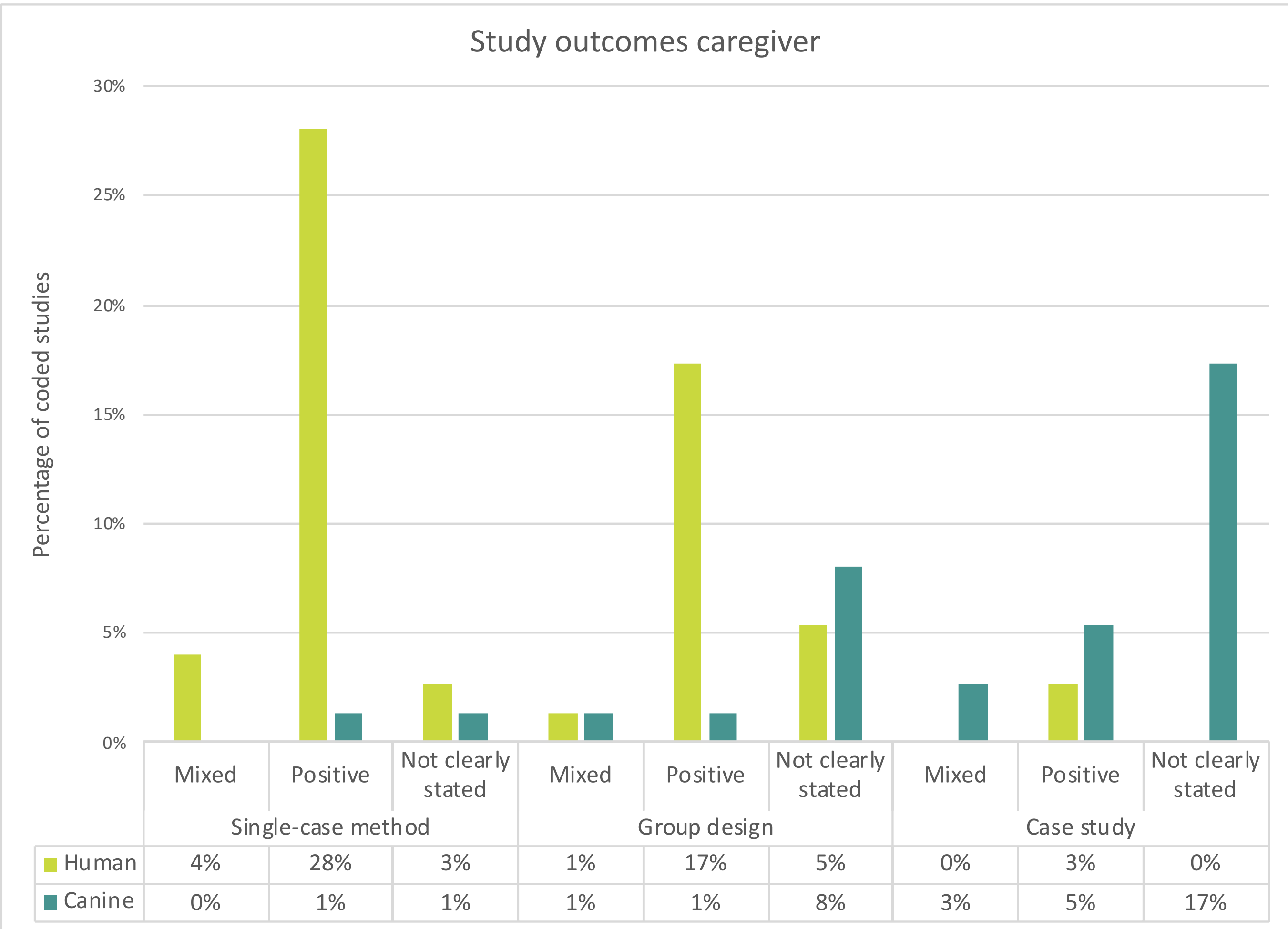


Figure 2. Bar diagramme displaying percentages of canine- and human-related caregiver training outcomes as they relate to study designs.

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Table 1. Detailed display of study designs, respective interventions and outcomes for canine and human studies.

Study designs	#	#	Percentage	Percentage	Total	Percentage
Outcomes and respective interventions	Human	Canine	Human	Canine		
Single-case method	26	2	35%	3%	28	37%
Positive	21	1	28%	1%	22	29%
Package	14	1	19%	1%	15	20%
Modelling + Package	1	0	1%	0%	1	1%
Package + Video modelling	1	0	1%	0%	1	1%
Written instruction/advice + Video modelling	1	0	1%	0%	1	1%
Written instruction/advice + Modelling & role play	1	0	1%	0%	1	1%
Package + Feedback	1	0	1%	0%	1	1%
Feedback	1	0	1%	0%	1	1%
Oral instruction/advice + Package	1	0	1%	0%	1	1%
Not clearly stated	2	1	3%	1%	3	4%
Package	1	1	1%	1%	2	3%
Written instruction/advice	1	0	1%	0%	1	1%
Mixed	3	0	4%	0%	3	4%
Package	2	0	3%	0%	2	3%
Written instruction/advice + Video modelling + Feedback + Modelling	1	0	1%	0%	1	1%
Group design	18	8	24%	11%	26	33%
Positive	13	1	17%	1%	14	19%
Package	11	0	15%	0%	11	15%
Oral instruction/advice	0	1	0%	1%	1	1%
Oral instruction/advice + Modelling	1	0	1%	0%	1	1%
Package + Written instruction/advice + Oral instruction/advice	1	0	1%	0%	1	1%
Not clearly stated	4	6	5%	8%	10	13%
Package	4	2	5%	3%	6	8%
Oral instruction/advice + Written instruction/advice	0	2	0%	3%	2	3%
Obedience training + Quality time	0	2	0%	3%	2	3%
Mixed	1	1	1%	1%	2	2%
Written instruction/advice	0	1	0%	1%	1	1%
Package	1	0	1%	0%	1	1%
Case study	2	19	3%	25%	21	28%
Not clearly stated	0	13	0%	17%	13	17%
Oral instruction/advice	0	7	0%	9%	7	9%
Oral instruction/advice + Written instruction/advice	0	5	0%	7%	5	7%
Package	0	1	0%	1%	1	1%
Positive	2	4	3%	5%	6	8%
Oral instruction/advice	0	2	0%	3%	2	3%
Oral instruction/advice + Modelling	0	1	0%	1%	1	1%
Oral instruction/advice + Modelling + Feedback	1	0	1%	0%	1	1%
Package	1	0	1%	0%	1	1%
Oral instruction/advice + Written instruction/advice	0	1	0%	1%	1	1%
Mixed	0	2	0%	3%	2	3%
Oral instruction/advice + Written instruction/advice	0	2	0%	3%	2	3%
TOTAL	46	29	61%	39%	75	100%

Note. Percentages have been rounded and may not total 100%. Within a total of 66 eligible studies, 77 study designs and 75 interventions were found.

DISCUSSION

- The finding that many canine-related interventions are published as case studies was also reported by Butler *et al.* (2011). This may hint to the notion that while the need for individual assessment and treatment of undesired behaviours has been acknowledged by applied animal behaviourists the step of adopting SCMs as means of quantitatively analysing behaviour change has not yet been initiated.
- Caregiver outcomes were found to be somewhat inconclusive across canine-related studies, while outcomes across human-related studies were consistently positive. The latter may be linked to the systematic behaviour-analytic approach on parent training which highlights the need for testing the suitability and efficacy of various teaching strategies (i.e. modelling or feedback) with dog owners. A starting point may be to implement structured approaches, i.e. behavioural skills training in the teaching process of dog owners on how to train their dogs.
- The finding that most canine-related interventions comprised oral instruction/advice only yielding inconclusive outcomes may further the notion that oral instruction/advice is not sufficient to teach owners the necessary skills to train their dogs. This suggestion seems to be further backed up by the finding that parent-training packages (i.e. written instruction/advice and video modelling or modelling and feedback) yielded almost consistently positive outcomes.
- One limitation of the current review is that the implemented search strategy lead to high sensitivity (i.e. proportion of all studies retrieved by the search) but at the same time yielded low specificity (i.e. proportion of retrieved studies that were relevant) which results in relevant studies being hidden among many of irrelevant sources (Petticrew and Roberts, 2006).

CONCLUSION

- Training caregivers does matter, as shown by the human-related study outcomes.
- Further research of the systematic teaching of dog owners is needed.
- A more detailed analysis of the various teaching components of the parent-training packages is encouraged.

